

**SLIDING CARRIAGE FOR VERTICAL BLIND****BACKGROUND OF THE INVENTION****1. Field of the Invention**

The invention relates to a sliding carriage, more particularly to a sliding carriage for a vertical blind and movable within a support rail.

**2. Description of the Related Art**

Referring to Figure 1, United States Patent No. 6321821 discloses a slat carriage for hanging a slat 10 of a vertical blind. The slat carriage includes a main body 11 defining an interior space, and a transmission mechanism 12 received in the interior space. The transmission mechanism 12 includes a toothed wheel 121 supported in the main body 11 and rotatable about a vertical axis, a pivot pin 122 connected to the toothed wheel 121 and inserted into the main body 11, and a clip 123 fixed on one end of the pivot pin 122 for hanging the slat 10.

During assembly, the toothed wheel 121 is disposed in the interior space of the main body 11 from a front or back side of the main body 11, after which the pivot pin 122 is inserted into an axial hole in the toothed wheel 121, and hence, the main body 11 through a hole in the bottom of the main body 11. However, it is difficult to insert the pivot pin 122 into the axial hole in the toothed wheel 121, and it is difficult to remove the pivot pin 122 from the axial hole in the toothed wheel

121 during disassembly. Furthermore, the toothed wheel  
121 wears out easily because it meshes with related  
elements during rotation. Assembly and disassembly of  
the slat carriage are difficult such that repair of the  
5 same at a later stage is also difficult.

#### SUMMARY OF THE INVENTION

Therefore, the object of the present invention is  
to provide a sliding carriage that can be easily  
assembled and disassembled to facilitate repair at a  
10 later stage.

According to this invention, a sliding carriage for  
a vertical blind is movable within a support rail, and  
comprises a main body, a slat hanging unit, and a clamp  
unit. The main body is adapted to be mounted slidably  
15 within the support rail, and has a bottom face and two  
opposite side faces. The main body includes a receiving  
space, a first hole that opens in the bottom face and  
that is in communication with the receiving space, and  
a second hole that opens in at least one of the side  
20 faces and that intersects the first hole below the  
receiving space. The slat hanging unit includes a head  
portion, a clip, and a neck portion. The head portion  
is rotatable about a vertical axis, and is inserted into  
the receiving space through the first hole. The clip  
25 is connected to the head portion, and extends outwardly  
of the main body. The neck portion is disposed between  
the head portion and the clip. The clamp unit is inserted

into the second hole, and holds rotatably the neck portion.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiment with reference to the accompanying drawings, of which:

Figure 1 is a partly exploded perspective view of a slat carriage disclosed in U. S. Patent No. 6321821;

Figure 2 is a partly exploded perspective view of the preferred embodiment of a sliding carriage according to the present invention;

Figure 3 is a schematic side view of the preferred embodiment in an assembled state;

Figure 4 is a side view of a main body of the preferred embodiment;

Figure 5 is a sectional view of the preferred embodiment, illustrating how a clamp unit is inserted into a second hole in the main body; and

Figure 6 is a sectional view taken along line VI-VI of Figure 3.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring to Figures 2 to 6, the preferred embodiment of a sliding carriage according to the present invention is adapted for hanging a slat 20 of a vertical blind (not shown), and is shown to comprise a main body 3, a slat hanging unit 4, a clamp unit 5, a driving unit

6, and two wheels 7.

The main body 3 is adapted to be mounted slidably within the support rail 21, and has a bottom face 301 (see Figure 3) and two opposite side faces 302 (only one is visible in Figure 2). The main body 3 includes a receiving space 31, a first hole 313 that opens in the bottom face 301 and that is in communication with the receiving space 31, a second hole 32 that opens in the side faces 302 and that intersects the first hole 313 below the receiving space 31, and a third hole 33 that opens in the side faces 302 and that is in communication with the receiving space 31. The second hole 32 has two open ends 321 (only one is visible in Figure 2) which extend respectively through the side faces 302. The main body 3 further includes a stop member 304 (see Figure 5) formed within the second hole 32 and connected to one of the side faces 302. The stop member 304 divides one of the open ends 321 into two openings 322 (see Figures 4 and 5), and has two abutment faces 305 (see Figure 5).

The slat hanging unit 4 includes a head portion 41, a clip 43, and a neck portion 42. The head portion 41, in this embodiment, has gear teeth 410, and is rotatable about a vertical axis. The head portion 41 is inserted into the receiving space 31 through the first hole 313, and has a protruding spindle 411 on a top end thereof. The spindle 411 is received in a groove 311 formed in

an inner wall of the main body 3 which defines the receiving space 31. The clip 43 is connected integrally to the head portion 41, and extends outwardly of the main body 3 for hanging the slat 20 of the blind. The neck portion 42 is disposed between the head portion 41 and the clip 43.

The clamp unit 5 is inserted into the second hole 32 in the main body 3, and holds rotatably the neck portion 42 of the slat hanging unit 4. The clamp unit 5, in this embodiment, is formed as a plate having a pair of interconnected opposite arms 52 that define therebetween a substantially circular slot 53 for receiving rotatably the neck portion 42 of the slat hanging unit 4, and an elongated slit 51 connected to and extending outwardly from the slot 53. The slit 51 is narrower than the slot 53. The arms 52 have distal ends 521 abutting respectively against the abutment faces 305 of the stop member 304. A plurality of protrusions 54 are formed on a top surface of the clamp unit 5.

The driving unit 6 is inserted into the third hole 33 in the main body 3, and can be rotated by an external force. In this embodiment, the driving unit 6 is a worm 61 that meshes with the gear teeth 410 of the head portion 41 of the slat hanging unit 4. When the worm 61 is rotated so as to rotate the head portion 41, the slat 20 is moved to a predetermined angle so as to adjust a shielding

angle of the slat 20.

The wheels 7 are mounted respectively on two opposite sides of the main body 3 to roll on support seats 303 of the support rail 21. Since the wheels 7 are elements  
5 commonly seen in a conventional sliding carriage, a detailed description of the same will be dispensed herewith for the sake of brevity.

When the clamp unit 5 is inserted into the second hole 32 in the main body 3, the arms 52 of the clamp  
10 unit 5 initially slide on two sides of the neck portion 42 of the slat hanging unit 4 so that the slit 51 between the arms 52 is enlarged, as best shown in Figure 5. Thereafter, the arms 52 move further into the respective openings 322. At this time, the slot 53 receives  
15 fittingly and rotatably the neck portion 42, and the distal ends 521 of the arms 52 abut respectively against the abutment faces 305 of the stop member 304, as best shown in Figure 6.

After the clamp unit 5 is inserted into the second  
20 hole 32 in the main body 3, the protruding spindle 411 of the head portion 41, as shown in Figure 3, is received rotatably in the groove 311 in the main body 3, and the neck portion 42 of the slat hanging unit 4 is clamped by the clamp unit 5 within the slot 53 so that the slat  
25 hanging unit 4 can rotate within the main body 3, but is restricted from moving upward and downward or leftward and rightward. The protrusions 54 of the clamp unit 5

abut against a bottom surface 412 of the head portion 41 at this time so as to reduce friction between the bottom surface 412 of the head portion 41 and a top surface of the clamp unit 5.

5       To assemble the sliding carriage of the present invention, the slat hanging unit 4 is simply inserted into the receiving space 31 in the main body 3 through the first hole 313, after which the clamp unit 5 is inserted into the second hole 32 so as to clamp rotatably  
10       the slat hanging unit 4 within the main body 3.

      When the head portion 41 of the slat hanging unit 4 wears out or the clamp unit 5 is damaged, these elements can be replaced or repaired easily. To this end, a thin elongated tool can be used to push the distal ends 521  
15       of the arms 52 of the clamp unit 5 away from the respective opening 322 and out of the second hole 32 so that the clamp unit 5 can be removed from the main body 3 to subsequently remove the slat hanging unit 4 from the main body 3.

20       From the aforementioned description of the preferred embodiment, it is apparent that, through the clamp unit 5, the slat hanging unit 4 can be retained rotatably on the main body 3. The clamp unit 5 and the slat hanging unit 4 are easily removed for replacement or repair,  
25       such that assembly and disassembly of the sliding carriage of the present invention are quite simple.

      While the present invention has been described in

connection with what is considered the most practical and preferred embodiment, it is understood that this invention is not limited to the disclosed embodiment but is intended to cover various arrangements included within the spirit and scope of the broadest interpretation so as to encompass all such modifications and equivalent arrangements.